INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS

PURPOSE OF THE TABLE: • To assist in project planning • To accompany the site conceptual model • To present possible receptors, exposure routes, and exposure pathways • To present the rationale for selection or exclusion of each exposure pathway • To communicate risk information to interested parties outside EPA.	
INFORMATION DOCUMENTED: • Exposure pathways that were examined and excluded from analysis • Exposure pathways that will be qualitatively and quantitatively evaluated in the risk assessment.	
TABLE NUMBERING INSTRUCTIONS • Complete one copy of this table only. • Number it Table 1. • The table should contain a row for each Exposure Pathway considered.	***An Exposure Pathway is defined as each unique combination of Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, Receptor Age, and Exposure Route.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 2 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) originally contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Column 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
Column 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2 Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Describe the exposure point as text in the Table (not to exceed 80 characters).	***The text in the Table can not exceed 80 characters.***
Column 5 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 6 - Receptor Age	
Definition: • The description of the exposed individual as defined by the EPA Region or dictated by the site.	***For example, an adult (receptor age) resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
Column 7 - Exposure Route	
Definition: • The way a chemical comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Choose from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined*** **(Inhalation and Ingestion)** ***Dermal Absorption*** ***Not Documented*** ***External (Radiation)***
Column 8 - On-Site/Off-Site	
Definition: • The location of potential contact between a person and a chemical (contaminant) as it relates to the site boundary.	
Instructions: • Choose from the picklist to the right.	***On-site*** ***Off-site*** ***On-site/Off-site*** ***Not Documented***

INSTRUCTIONS FOR TABLE 1

SELECTION OF EXPOSURE PATHWAYS (continued)

Column 9 - Type of Analysis	
Definition: • The level of evaluation (quantitative or qualitative) to be performed for the exposure pathway based on site-specific analysis.	
Instructions: • Choose from the picklist to the right.	***Quant* (Quantitative)** ***Qual* (Qualitative)** ***None***
Column 10 - Rationale for Selection or Exclusion of Exposure Pathway	
Definition: • The reason the exposure pathway was selected or not selected for quantitative or qualitative analysis.	
Instructions: • Document the reason for selecting or excluding a pathway for analysis. Provide a narrative rationale for each exposure route.	***Follow Regional guidance for the rationale codes. The narrative in the Table cannot exceed 200 characters.***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

PURPOSE OF THE TABLE:

- To provide information useful for data evaluation of chemicals detected
- To provide adequate information so the user/reviewer gets a sense of the chemicals detected at the site and the potential magnitude of the potential problems at the site
- To provide chemical screening data and rationale for selection of COPCs.

INFORMATION DOCUMENTED:

- Statistical information about chemicals detected in each medium
- The detection limits of chemicals analyzed
- The toxicity screening values for COPC selection
- Which chemicals were selected or deleted as COPCs.

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS:

- Complete one copy of Table 2 for each unique combination of the following four fields that will be quantitatively evaluated in the risk assessment (Scenario Timeframe, Medium, Exposure Medium, and Exposure Point).
- Enter each combination of these four fields in the Summary Box in the upper left corner of the table.
- Number each table uniquely, beginning with 2.1 and ending with 2.n, where "n" represents the total number of combinations of the four key fields.

For the example table provided, there should be four copies of Table 2, numbered 2.1, 2.2, 2.3, and 2.4.

Table Number	*Scenario Timeframe*	*Medium*	*Exposure Medium*	*Exposure Point*
2.1	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1 - Tap Water*
2.2	*Current*	*Groundwater*	*Air*	*Aquifer 1 - Water Vapors at Showerhead*
2.3	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*
2.4	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*

It is possible that some Standard Tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.

In the example Standard Tables, the sediment data in Tables 2.3 and 2.4 will be the same even though the Scenario Timeframes (current and future) are different.

Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) originally contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
Row 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	
BODY OF THE TABLE	
Column 1 - CAS Number	
Definition: • The Chemical Abstract Registry Number, a unique standardized number which is assigned to chemicals.	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Provide the CAS Number for each chemical detected in the samples for the medium.	***Include dashes in the CAS number. CAS numbers can be arranged in the order that the risk assessor prefers.***
Column 2 - Chemical	
Definition: • The name of the compound detected in samples for the medium.	
Instructions: • Provide the names of the chemicals which were detected in the sample for the medium.	***Chemicals can be grouped in the order that the risk assessor prefers.***
Column 3 - Minimum Concentration	
Definition: • The lowest detected concentration of the chemical in the medium.	
Instructions: • Enter the minimum detected concentration for the medium. • Footnote the heading and provide an explanation of the method used to determine the minimum concentration.	
Column 4 - Minimum Qualifier	
Definition: • The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the minimum concentration value.	
Instructions: • Enter the qualifier associated with the minimum concentration for each chemical.	***Provide the definition of each qualifier in the table footnotes or in separate documentation.***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Column 5 - Maximum Concentration	
Definition: • The highest detected concentration of the chemical in the medium.	
Instructions: • Enter the maximum detected concentration for the medium. • Footnote the heading and provide an explanation of the method used to determine the maximum concentration.	
Column 6 - Maximum Qualifier	
Definition: • The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the maximum concentration value.	
Instructions: • Enter the qualifier associated with the maximum concentration for each chemical.	***Provide the definition of each qualifier in the table footnotes or in separate documentation.***
Column 7 - Units	
Definition: • The concentration units for each chemical detected.	
Instructions: • Enter the units for each chemical. Units may vary among matrices/media.	***Refer to Regional guidance to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, ug/L for groundwater).*** ***Refer to Glossary for Units picklist***
Column 8 - Location of Maximum Concentration	
Definition: • The sample number which identifies the location where the sample was taken.	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Enter the sample identifier which corresponds to the location where the sample was taken.	
Column 9 - Detection Frequency	
Definition: • The number of times the chemical was detected versus the number of times it was analyzed, expressed as the "fraction" X/Y.	***Refer to Regional guidance for an explanation of how detection frequency should be interpreted and applied.***
Instructions: • Indicate the number of times a chemical was detected versus the number of times it was analyzed as the "fraction" X/Y.	***For example, 5/9 indicates that a chemical was detected in 5 out of 9 samples.***
Column 10 - Range of Detection Limits	
Definition: • The lowest and highest detection limits.	
Instructions: • Enter the lowest and highest detection limit for the chemical in the medium.	
Column 11 - Concentration Used for Screening	
Definition: • The detected concentration which was used to compare to the screening value.	***Refer to Regional guidance in determining this value. For example, maximum or average.***
Instructions: • Enter a concentration for each chemical being evaluated for the medium. • Footnote the heading and provide a reference/explanation of the concentration value.	

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Column 12 - Background Value	
Definition: • The background value for the chemical in that medium as defined by Regional guidance. ***If Regional guidance requires a "t-test" or other test which requires backup information, this supporting information should be provided separately.***	***Refer to Regional guidance for how background values are determined and whether and how background values are considered for COPC screening.***
Instructions: • Enter the numerical value in the column, consistent with Regional guidance. • Footnote the heading and provide a reference/explanation for the derivation of the background value.	***For example, literature value, data from a nearby site, statistical tool.***
Column 13- Screening Toxicity Value	
Definition: • The screening level used to compare detected concentrations of chemicals.	***Refer to Regional guidance for the source of the screening value and for guidance on comparing the screening value to detected concentrations.***
Instructions: • Enter the screening toxicity value, in accordance with Regional guidance. • If no toxicity value is available for the chemical, enter "N/A." • Also indicate, with an "N" or "C" whether the value is based on non-cancer or cancer effects, respectively. • Footnote the heading and provide a reference/explanation for the source of the screening values used.	***N* (non-cancer)** ***C* (cancer)**
Column 14 - Potential ARAR/TBC Value	
Definition: • Applicable or relevant and appropriate requirements (ARAR) and to be considered (TBC) values.	***Refer to Regional guidance regarding the requirements for this column. For example, MCL values, soil cleanup level values, or other values to be considered.***

INSTRUCTIONS FOR TABLE 2

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (continued)

Instructions: • Enter appropriate values, consistent with Regional guidance. • If no value is available or appropriate, enter "N/A".	
Column 15 - Potential ARAR/TBC Source	
Definition: • The type or source of the ARAR/TBC value entered into Column 14.	***For example, MCL or SMCL.***
Instructions: • Enter the type or source of ARAR/TBC value which corresponds to the value in Column 14.	
Column 16 - COPC Flag	
Definition: • A code which identifies whether the chemical has been selected as a COPC, based on Regional screening guidance.	
Instructions: • Enter "Yes" or "No" to indicate whether the chemical has been retained as a COPC.	***Yes*** ***No***
Column 17 - Rationale for Contaminant Deletion or Selection	
Definition: • The reason that the chemical was selected or not selected for quantitative or qualitative analysis.	***Follow Regional guidance for the rationale codes.***
Instructions: • Enter the rationale codes in accordance with Regional guidance for selection/deletion of chemicals of potential concern. • Footnote the heading and define the rationale codes in the footnotes.	***The example data table provides rationale codes for example purposes only. Regional guidance may suggest additional/different codes.***

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

PURPOSE OF THE TABLE:

- To provide the reasonable maximum and central tendency medium-specific exposure point concentrations (EPCs) for measured and modeled values
- To provide statistical information on the derivation of the EPCs.

INFORMATION DOCUMENTED:

- Statistical information which was used to calculate the Medium EPCs for chemicals detected in each medium
- The reasonable maximum exposure (RME) Medium EPC and the central tendency (CT) Medium EPC selected
- The statistics which were used to make the determinations as well as the rationale for the selection of the statistics for each chemical (i.e., discuss statistical derivation of measured data or approach for modeled data).

The medium-specific or Medium EPC is the same for a particular medium regardless of exposure route. The Medium EPC does not consider the transfer of contaminants from one medium to another, unlike the Route EPC presented on Tables 7 and 8. See Tables 7 and 8 for additional information on Medium EPC and Route EPC.

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS:

- Complete one copy of Table 3 for each unique combination of the following four fields that will be quantitatively evaluated (Scenario Timeframe, Medium, Exposure Medium, and Exposure Point).
- Enter each combination of these four fields in the Summary Box in the upper left corner of the table.
- Number each table uniquely, beginning with 3.1 and ending with 3.n, where "n" represents the total number of combinations of the four key fields.

For the example data provided, there should be four copies of Table 3, numbered 3.1, 3.2, 3.3 and 3.4.

Table Number	*Scenario Timeframe*	*Medium*	*Exposure Medium*	*Exposure Point*
3.1	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1 - Tap Water*
3.2	*Current*	*Groundwater*	*Air*	*Aquifer 1 - Water Vapors at Showerhead*
3.3	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*
3.4	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek.*

It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.

In the example Standard Tables, the sediment data in Tables 3.3 and 3.4 may be the same even though the Scenario Timeframes (current and future) are different.

Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Attach supporting documentation regarding how the EPC was calculated. • Attach an example calculation so the methodology used to develop EPCs is clear to a reviewer. • Attach supporting information regarding how the concentration term was selected. • Refer to Regional guidance concerning use of decimals or scientific notation for data. • For certain media, all columns will not be completed.	***This information should be of sufficient detail that a reviewer can check and verify the calculations which were performed and obtain the same results as listed in this table.*** ***It is possible that the highest detected value is the RME, so the 95% UCL may not need to be calculated, particularly, if only one data point is being considered.*** ***For example, in some regions, the arithmetic average of concentrations measured from the center of the plume is used as the RME. In this case, the 95% UCL column does not need to be completed.***
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) originally contaminated.	

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Row 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	
BODY OF THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals which were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers.***
Column 2 - Units	
Definition: • The concentration units for each chemical detected.	
Instructions: • Enter units for each chemical. Units may vary among matrices/media.	***Refer to Regional guidance to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, ug/L for groundwater).***

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Column 3 - Arithmetic Mean	
Definition: • The arithmetic average of detected concentrations.	
Instructions: • Enter the arithmetic average of detected concentrations. • Footnote the heading and provide an explanation of the method used to determine the arithmetic mean.	***For duplicate samples, multiple rounds of sampling, and other data evaluation questions, refer to Regional guidance.***
Column 4 - 95% UCL of Normal Data	
Definition: • The statistic for the 95% Upper Confidence Limit on the arithmetic mean of measured data.	***Refer to National guidance (Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive: 9285.7-08l, May 1992) and Regional guidance for calculating this term.***
Instructions: • Enter the 95% UCL for each COPC. • Footnote the heading and indicate any assumptions made in calculating the term. • Supporting information should be provided.	***For example, for non-detects, ½ the sample quantitation limit is sometimes used as a proxy concentration. For duplicate sample results, the average value is sometimes used in the calculation.***
Column 5 - Maximum Detected Concentration	
Definition: • The highest detected concentration of the chemical in the medium at the exposure point which is above the sample quantitation limit.	
Instructions: • Enter the maximum concentration value.	
Column 6 - Maximum Qualifier	
Definition: • The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the maximum concentration value.	

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Instructions: • Enter the qualifier associated with the maximum concentration.	***Provide the definitions of each qualifier in the table footnotes or in supporting information.***
Column 7 - EPC Units	
Definition: • The units of the data being used to calculate the EPC.	
Instructions: • Enter the units for the data being used to calculate the EPC.	***Follow Regional guidance for preferences for different media (e.g., ug/L for groundwater; mg/kg for soil).***
Column 8 - Medium EPC Value (for RME)	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the RME exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another. ***For example,*** ***the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the Medium EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data.***
Instructions: • Enter the value in the column. • Footnote the heading and explain how the value was derived.	***Refer to Regional guidance concerning how to determine this value.***

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Column 9 - Medium EPC Statistic (for RME)	
Definition: • The statistic selected to represent the Medium EPC Value (for RME), based on Regional guidance, the distribution of the data, number of data points, etc.	***Often this is 95% UCL of the log-transformed data.***
Instructions: • Enter the statistic used by choosing from the picklist to the right. • If the statistic used is not on the picklist, enter an abbreviation in Column 9 and provide a description of the statistic in the footnotes of the table.	***Max (Maximum)*** ***95% UCL - N (95% UCL of Normal Data)*** ***95% UCL- T (95% UCL of Log-transformed Data)*** ***Mean - N (Mean of Normal Data)*** ***Mean - T (Mean of Log-transformed Data)***
Column 10 - Medium EPC Rationale (for RME)	
Definition: • The reason the cited statistic was used to represent the EPC for RME.	
Instructions: • Enter the rationale for the selection.	
Column 11 - Medium EPC Value (for CT)	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the CT exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another. ***For example,*** ***the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the Medium EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data.***
Instructions: • Enter the value in the column.	***Refer to Regional guidance concerning how to determine this value.***

INSTRUCTIONS FOR TABLE 3

MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY (continued)

Column 12 - Medium EPC Statistic (for CT)	
Definition: • The statistic selected to represent the Medium EPC Value (for CT), based on Regional guidance, the distribution of the data, number of data points, etc.	***Often this is a Mean for a normally distributed data set.***
Instructions: • Enter the statistic used by choosing from the picklist to the right. • If the statistic used is not on the picklist, enter an abbreviation in Column 12, and provide a description of the statistic in the footnotes of the table.	***Max (Maximum)*** ***95% UCL - N (95% UCL of Normal Data)*** ***95% UCL- T (95% UCL of Log-transformed Data)*** ***Mean - N (Mean of Normal Data)*** ***Mean - T (Mean of Log-transformed Data)***
Column 13 - Medium EPC Rationale (for CT)	
Definition: • The reason the cited statistic was used to represent the EPC for CT.	
Instructions: • Enter the rationale for the selection.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS

PURPOSE OF THE TABLE: • To provide the exposure parameters used for RME and CT intake calculations for each exposure pathway (scenario timeframe, medium, exposure medium, exposure point, receptor population, receptor age, and exposure route) • To provide the intake equations or models used for each exposure route/pathway.	
INFORMATION DOCUMENTED: • Values used for each intake equation for each exposure pathway and the reference/rationale for each • Intake equation or model used to calculate the intake for each exposure pathway.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS:

- Complete one copy of Table 4 for each unique combination of the following six fields that will be quantitatively evaluated (Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, and Receptor Age).
- Enter each combination of these six fields in the Summary Box in the upper left corner of the table.
- Number each table uniquely, beginning with 4.1 and ending with 4.n, where "n" represents the total number of combinations of the six key fields.

For the example data provided, there should be seven copies of Table 4, numbered 4.1 through 4.7

Table Number	*Scenario Timeframe*	*Medium*	*Exposure Medium*	*Exposure Point*	*Receptor Population*	*Receptor Age*
4.1	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Adult*
4.2	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Child*
4.3	*Current*	*Groundwater*	*Air*	*Aquifer 1-- Water Vapors at Showerhead*	*Resident*	*Adult*
4.4	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
4.5	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*
4.6	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
4.7	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*

It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.

In the example Standard Tables, the sediment data in Tables 4.4 through 4.7 may be the same, even though the Scenario Timeframes and Receptor Ages are different.

Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The environmental substance (e.g, air, water, soil) which has been contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***
Row 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout in Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	***The field can not exceed 80 characters.***
Row 5 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***
Row 6 - Receptor Age	
Definition: • The description of the exposed individual as defined by the EPA Region or dictated by the site.	***For example, a resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Exposure Route	
Definition: • The way a chemical comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Choose from the picklist to the right.	***Inhalation*** ***Ingestion* (i.e., Inhalation and Ingestion)** ***Combined*** ***Dermal Absorption*** ***Not Documented*** ***External (Radiation)***

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Column 2 - Parameter Code

Definition:

- The code used for parameters in the intake equation.

Instructions:

- Enter the appropriate code for the intake parameter from the picklist below.
- Develop additional intake parameter codes as necessary.

Parameter Code	*Parameter Definition*	*Units*
CS	*Chemical Concentration in Soil*	*mg/kg*
CW	*Chemical Concentration in Water*	*ug/l*
IR-W	*Ingestion Rate of Water*	*liters/day*
EF	*Exposure Frequency*	*days/year*
ED	*Exposure Duration*	*years*
CF1	*Conversion Factor 1*	*mg/ug*
BW	*Body Weight*	*kg*
AT-C	*Averaging Time (Cancer)*	*days*
AT-N	*Averaging Time (Non-Cancer)*	*days*
KP	*Permeability Constant (Dermal for Liquids)*	*cm/hr*
ET	*Exposure Time*	*hr/day*
CF2	*Conversion Factor 2*	*l/cm3*
SA	*Skin Surface Area Available for Contact*	*cm2*
IN	*Inhalation Rate*	*m^3/hr*
IR-SM	*Ingestion Rate (Swimming)*	*l/hr*
IR-S	*Ingestion Rate of Soil*	*mg/day*
DABS	*Dermal Absorption Factor (Solid)*	*--*
SSAF	*Soil to Skin Adherence Factor*	*mg/cm^2/event*
IR-F	*Ingestion Rate of Food*	*kg/meal*
EF-F	*Exposure Freqeuncy (Food)*	*meals/year*

Do not provide detailed information regarding modeled intakes in this table. This information should be provided separately. The table should list the name of the model used or the equation with a footnote providing a reference to the supporting information regarding route-specific EPCs and modeled intake development.

Column 3 - Parameter Definition

Definition:

- The parameter used in the intake equation.

Instructions:

- Enter the parameter definition, consistent with the picklist defined under Column 2.
- Develop additional intake parameter definitions as necessary.

Do not provide detailed information regarding modeled intakes in this table. This information should be provided separately. The table should list the name of the model used or the equation with a footnote providing a reference to the supporting information regarding route-specific EPCs and modeled intake development.

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Column 4 - Units	
Definition: • The units for the parameter code used in the intake equation.	
Instructions: • Enter the units for each parameter code consistent with the picklist defined under Column 2. • Develop additional intake parameter units as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, ug/L for groundwater).*** ***Refer to Glossary for Units picklist***
Column 5 - RME Value	
Definition: • The parameter value used for the RME intake calculation.	
Instructions: • Enter the values used for RME calculations. • For the CS and CW (chemical concentrations in soil and water, respectively) parameters, refer to Table 3.n or supporting documentation, as appropriate.	***Refer to Regional guidance for intake parameter values appropriate for each exposure pathway.***
Column 6 - RME Rationale/Reference	
Definition: • The reason and reference for the parameter value used.	***This rationale may be based upon Regional or National guidance.***
Instructions: • Enter the rationale and reference for the value. • If the value used is inconsistent with guidance values, provide a detailed explanation of the rationale and a complete reference for the value used.	***Provide sufficient detail that the reviewer can easily substantiate the value.***
Column 7 - CT Value	
Definition: • The parameter value used for the CT exposure intake calculation.	

INSTRUCTIONS FOR TABLE 4

VALUES USED FOR DAILY INTAKE CALCULATIONS (CONTINUED)

Instructions: • Enter the values used for CT exposure calculations. • For the CS and CW (chemical concentrations in soil and water, respectively) parameters, refer to Table 3.n or supporting documentation, as appropriate.	***Refer to Regional guidance for intake parameter values appropriate for each exposure pathway.***
Column 8 - CT Rationale/Reference	
Definition: • The reason and reference for the parameter value used.	***This rationale may be based on Regional or National guidance.***
Instructions: • Enter the rationale and reference for the value. • If the value used is inconsistent with guidance values, provide a detailed explanation of the rationale and a complete reference for the value used.	***Provide sufficient detail that the reviewer can easily substantiate the value.***
Column 9 - Intake Equation/Model Name	
Definition: • The calculation, equation, or model used for intake estimates for each exposure route.	
Instructions: • Enter the National and/or Regional guidance for intake calculations, equations, and/or models.	***Do not provide detailed information regarding modeled intakes in this table. This information should be provided separately. The table should list the name of the model used or the equation footnote providing a reference to the supporting information regarding route-specific EPCs and modeled intake development.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL

PURPOSE OF THE TABLE: • To provide information on RfDs, target organs, and adjustment factors for chemicals • To provide oral to dermal adjustment factors • To verify references for non-cancer toxicity data.	
INFORMATION DOCUMENTED: • The RfDs for each of the COPCs, as well as modifying factors and oral to dermal adjustments • The organ effects of each of the COPCs • References for RfDs and organ effects.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.1. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.1 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the RfD for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	***The risk assessor should use professional judgement when extrapolating to time-frames shorter or longer than those employed in any crticial study referenced. As a Superfund program guide-line, chronic is seven years to a lifetime; subchronic is two weeks to seven years (RAGS Part A, Sections 6 and 8).***
Instructions: • Enter either "Chronic" or "Subchronic" in the field. Both values may be available for an individual COPC. • Subchronic values may not be available or necessary for an individual COPC. If that is the case, enter only "Chronic" in Column 2.	***Chronic*** ***Subchronic***
Column 3 - Oral RfD Value	
Definition: • The oral RfD value for each of the COPCs.	
Instructions: • Enter the value for the chronic and/or subchronic oral RfD (as appropriate).	
Column 4 - Oral RfD Units	
Definition: • The oral RfD units for each COPC.	
Instructions: • Enter units for each oral RfD as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 5 - Oral to Dermal Adjustment Factor	
Definition: • The adjustment factor used to convert oral RfD values to dermal RfD values.	
Instructions: • Enter the adjustment factor in this column.	
Column 6 - Adjusted Dermal RfD	
Definition: • The adjusted RfD for each COPC detected that is derived from the oral RfD.	
Instructions: • Enter the value that was derived from the adjustment factor in Column 5.	***Derivations of the adjusted dermal RfD should be performed in accordance with Regional guidance.***
Column 7 - Units (for Adjusted Dermal RfD)	
Definition: • The adjusted dermal RfD units for each COPC.	
Instructions: • Enter units for each adjusted RfD as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***
Column 8 - Primary Target Organ	
Definition: • The organ that is affected most (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Instructions: • Enter the name of the most affected organ or organ system in the column.	***If there are two organs that are equally affected, enter the names of both, separated by a '/'.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 9 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS/HEAST for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Instructions: • Enter number obtained from IRIS/HEAST.	***Refer to IRIS/HEAST for these values.***
Column 10 - Sources of RfD/Target Organ (Information)	
Definition: • The source of the RfD and target organ information.	
Instructions: • Enter the source of the RfD and target organ information. Use a colon to delineate between the two information sources if the sources of information are different for RfD and target organ.	***IRIS*** ***HEAST*** ***NCEA***
Column 11 - Dates (MM/DD/YY)	
Definition: • The date of the document that was consulted for the RfD information and the target organ information in MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***
Instructions: • Enter the date, in MM/DD/YY format, for both RfD and target organ information. Use a colon to delineate between the two dates, if the sources of information are different for RfD and target organ. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the article provided by NCEA.***	***For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***

INSTRUCTIONS FOR TABLE 5.1

NON-CANCER TOXICITY DATA - ORAL/DERMAL (continued)

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION

PURPOSE OF THE TABLE: • To provide information on RfCs, RfDs, target organs, and adjustment factors for chemicals • To provide RfC to RfD adjustment factors • To verify references for non-cancer toxicity data.	
INFORMATION DOCUMENTED: • The RfDs for each of the COPCs, as well as modifying factors and RfC to RfD adjustments • The organ effects of each of the COPCs • References for RfCs and organ effects.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.2. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.2 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE:	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers.***

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION (continued)

Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the RfC or RfD for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	***The risk assessor should use professional judgement when extrapolating to time-frames shorter or longer than those employed in any crticial study referenced. As a Superfund program guide-line, chronic is seven years to a lifetime; subchronic is two weeks to seven years (RAGS Part A, Sections 6 and 8).***
Instructions: • Enter either "Chronic" or "Subchronic" in the field. Both values may be available for an individual chemical. • "Subchronic" values may not be available or necessary for an individual COPC. If that is the case, enter "Chronic" in Column 2.	***Chronic*** ***Subchronic***
Column 3 - Inhalation RfC Value	
Definition: • The RfC value for each of the COPCs.	
Instructions: • Enter the value for the chronic and/or subchronic oral RfC (as appropriate).	
Column 4 - Units for Inhalation RfC	
Definition: • The RfC units for each chemical detected.	
Instructions: • Enter units for each RfC as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION (continued)

Column 5 - Adjusted Inhalation RfD	
Definition: • The inhalation RfD for each COPC that is derived from the RfC value.	***The derivation of the RfD from an RfC should be performed in accordance with Regional guidance.***
Instructions: • Enter the derived RfD factor in this column.	***The equation to derive the RfD from the RfC is to be included as a footnote in the table.***
Column 6 - Units (for Adjusted Inhalation RfD)	
Definition: • The adjusted RfD units for each COPC.	
Instructions: • Enter units for each adjusted RfD as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***
Column 7 - Primary Target Organ	
Definition: • The organ that is affected most (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Instructions: • Enter the name of the most affected organ or organ system in the column.	***If there are two organs that are equally affected, enter the names of both, separated by a '/'.***
Column 8 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS/HEAST for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***

INSTRUCTIONS FOR TABLE 5.2

NON-CANCER TOXICITY DATA - INHALATION (continued)

Instructions: • Enter number obtained from IRIS/HEAST.	***Refer to IRIS/HEAST for these values.***
Column 9 - Sources of RfC:RfD:Target Organ (Information)	
Definition: • The sources of the RfC, RfD, and target organ information.	
Instructions: • Enter the sources of the RfC, RfD, and target organ information. Use a colon to delineate between the information sources if the sources of information are different for RfC, RfD, and target organ.	***IRIS*** ***HEAST*** ***NCEA***
Column 10 - Date (MM/DD/YY)	
Definition: • The dates of the documents that were consulted for the RfC/RfD information and the target organ information in MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***
Instructions: • Enter the dates, in MM/DD/YY format, for RfC, RfD and target organ information. Use a colon to delineate between the dates, if the sources of information are different for RfC, RfD, and target organ. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the article provided by NCEA.***	***For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS

PURPOSE OF THE TABLE: • To provide information on toxicity values, target organs, and adjustment factors for unusual chemicals or circumstances that are not covered by Tables 5.1 or 5.2 • To verify references for non-cancer toxicity data.	***For example, a toxicity factor derived specifically for an individual risk assessment should be documented in Table 5.3.***
INFORMATION DOCUMENTED: • The toxicity values for each of the COPCs, as well as modifying factors • The organ effects of each of the COPCs • References for toxicity values and organ effects.	
TABLE NUMBERING INSTRUCTIONS: • Complete one copy of this table only. • Number it Table 5.3. • The table should contain a row for each COPC considered.	***If chronic and subchronic effects are listed for the same COPC, two rows will be required.***
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 5.3 does not replace the toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***Refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals can be grouped in the order that the risk assessor prefers.***

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA -SPECIAL CASE CHEMICALS (continued)

Column 2 - Chronic/Subchronic	
Definition: • Identifies whether the toxicity value for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	***The risk assessor should use professional judgement when extrapolating to time-frames shorter or longer than those employed in any crticial study referenced. As a Superfund program guide-line, chronic is seven years to a lifetime; subchronic is two weeks to seven years (RAGS Part A, Sections 6 and 8).***
Instructions: • Enter either "Chronic" or "Subchronic" in the field. Both values may be available for an individual COPC. • "Subchronic" values may not be available or necessary for an individual chemical. If that is the case, enter only "Chronic" in the column.	***Chronic*** ***Subchronic***
Column 3 - Toxicity Value	
Definition: • The toxicity value for each COPC.	
Instructions: • Enter the value for the chronic and/or subchronic toxicity values (as appropriate).	
Column 4 - Toxicity Units	
Definition: • The units associated with the toxicity value for each COPC.	
Instructions: • Enter units for each reference as necessary.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA -SPECIAL CASE CHEMICALS (continued)

Column 5 - Primary Target Organ	
Definition: • The organ that is affected most (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Instructions: • Enter the name of the most affected organ or organ system in the column.	***If there are two organs that are equally affected, enter the names of both, separated by a '/'.***
Column 6 - Combined Uncertainty/Modifying Factors	
Definition: • The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS/HEAST for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Instructions: • Enter number obtained from IRIS/HEAST.	***Refer to IRIS/HEAST for these values.***
Column 7 - Sources of Toxicity/Primary Target Organ Information	
Definition: • The sources of the toxicity and target organ information.	
Instructions: • Enter the sources of the toxicity and target organ information.	***IRIS*** ***HEAST*** ***NCEA***
Column 8 - Date (MM/DD/YY)	
Definition: • The dates of the document that were consulted for the toxicity information and the target organ information in MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***

INSTRUCTIONS FOR TABLE 5.3

NON-CANCER TOXICITY DATA -SPECIAL CASE CHEMICALS (continued)

Instructions: • Enter the dates, in MM/DD/YY format, for the toxicity and target organ information. Use a colon to delineate between the dates, if the sources of information are different for toxicity and target organ. • ***For IRIS references, provide the date IRIS was searched.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the article provided by NCEA.***	***For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL

PURPOSE OF THE TABLE: • To provide the oral and dermal cancer toxicity information (values and sources of information) for chemicals of potential concern • To provide the methodology and adjustment factors used to convert oral cancer toxicity values to dermal toxicity values • To provide weight of evidence/cancer guideline descriptions for each chemical of potential concern.	
INFORMATION DOCUMENTED: • Oral and dermal toxicity values for chemicals of potential concern • Weight of evidence/cancer guidelines descriptions for chemicals of potential concern • The source/reference for each toxicity value.	
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.1 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses.***

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 2 - Oral Cancer Slope Factor	
Definition: • Cancer slope factor for ingestion.	
Instructions: • Enter the oral cancer slope factor.	***Refer to IRIS and HEAST. If toxicity information is not available, contact EPA's National Center for Environmental Assessment (NCEA) office.***
Column 3 - Oral to Dermal Adjustment Factor	
Definition: • The adjustment factor used to convert the oral RfD values to dermal RfD values.	
Instructions: • Enter the oral to dermal adjustment factor.	***Refer to RAGS and Regional guidance.***
Column 4 - Adjusted Dermal Cancer Slope Factor	
Definition: • The adjusted dermal cancer slope factor for each chemical of potential concern which typically is derived from the oral cancer slope factor.	***Derivation of the dermal cancer slope factor should be performed in accordance with Regional guidance.***
Instructions: • Enter the derived dermal cancer slope factor.	***Provide the equation/adjustment used for derivation.***
Column 5 - Units	
Definition: • The concentration units for each chemical detected.	
Instructions: • Enter the units for the cancer slope factors.	***Typically (mg/kg-day)$^{-1}$*** ***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***

INSTRUCTIONS FOR TABLE 6.1

CANCER TOXICITY DATA - ORAL/DERMAL (continued)

Column 6 - Weight of Evidence/Cancer Guideline Description	
Definition: • An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen.	
Instructions: • Provide the weight of evidence/cancer guideline description. • Choose from the categories to the right.	***EPA Group:*** ***A - Human carcinogen*** ***B1 - Probable human carcinogen - indicates that limited human data are available.*** ***B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.*** ***C - Possible human carcinogen*** ***D - Not classifiable as a human carcinogen*** ***E - Evidence of noncarcinogenicity*** ***Weight of Evidence:*** ***Known/Likely*** ***Cannot be Determined*** ***Not Likely***
Column 7 - Source	
Definition: • A reference for the weight of evidence/cancer guideline description entry.	
Instructions: • Enter the reference for toxicity information.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA***
Column 8 - Date (MM/DD/YY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***

Instructions:
• Enter the date in MM/DD/YY format. Use a comma to delineate between multiple dates, if multiple sources of data were used.
  • ***For IRIS references, provide the date IRIS was selected.***
  • ***For HEAST references, provide the date of the HEAST reference.***
  • ***For NCEA references, provide the date of the article provided by NCEA.***
	For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION

PURPOSE OF THE TABLE: • To provide the inhalation cancer toxicity information (values and sources of information) for chemicals of potential concern • To provide the methodology and adjustment factors used to convert inhalation unit risks to inhalation cancer slope factors • To provide weight of evidence/cancer guideline descriptions for each chemical of potential concern.	
INFORMATION DOCUMENTED: • Inhalation toxicity values for chemicals of potential concern • Weight of evidence/cancer guidelines descriptions for chemicals of potential concern • The source/reference for each toxicity value.	
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.2 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses.***

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Column 2 - Unit Risk	
Definition: • Toxicity values for carcinogenic effects expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. These measures can be calculated from cancer slope factors.	
Instructions: • Enter the inhalation unit risk value	***Refer to IRIS and HEAST; if toxicity information is not available, contact EPA's National Center for Environmental Assessment (NCEA) office.***
Column 3 - Units	
Definition: • The units used for the unit risk for each chemical detected.	
Instructions: • Enter the units for the unit risk values.	***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***
Column 4 - Adjustment	
Definition: • The value used to derive the inhalation cancer slope factor from the unit risk value.	***Toxicity values for carcinogenic effects also can be expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. These measures are called unit risks and can be calculated from cancer slope factors.***
Instructions: • Enter the adjustment factor used to convert unit risk to a cancer slope factor.	***Refer to RAGS/HEAST and Regional guidance.***

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Column 5 - Inhalation Cancer Slope Factor	
Definition: • A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime.	***Usually the cancer slope factor is the upper 95th % confidence limit of the dose-response curve for inhalation.***
Instructions: • Enter the inhalation cancer slope factor.	
Column 6 - Units	
Definition: • The units used for the inhalation cancer slope factor for each chemical detected.	
Instructions: • Enter the units for the cancer slope factors.	
Column 7 - Weight of Evidence/Cancer Guideline Description	
Definition: • An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen.	
Instructions: • Provide the weight of evidence/cancer guideline description. • Choose from the categories to the right.	***EPA Group:*** ***A - Human carcinogen*** ***B1 - Probable human carcinogen - indicates that limited human data are available.*** ***B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.*** ***C - Possible human carcinogen*** ***D - Not classifiable as a human carcinogen*** ***E - Evidence of noncarcinogenicity*** ***Weight of Evidence:*** ***Known/Likely*** ***Cannot be Determined*** ***Not Likely***

INSTRUCTIONS FOR TABLE 6.2

CANCER TOXICITY DATA - INHALATION (continued)

Column 8 - Source	
Definition: • A reference for the weight of evidence/cancer guideline description entry.	
Instructions: • Enter the reference for toxicity information.	***IRIS*** ***HEAST*** ***NCEA***
Column 9 - Date (MM/DD/YY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***
Instructions: • Enter the date in MM/DD/YY format. Use a comma to delineate between multiple dates, if multiple sources of information were used. • ***For IRIS references, provide the date IRIS was selected.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the article provided by NCEA.***	***For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***

INSTRUCTIONS FOR TABLE 6.3

CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS

PURPOSE OF THE TABLE: • To provide cancer toxicity information for "special case" chemicals.	***For example, a toxicity factor derived specifically for an individual risk assessment should be documented in Table 6.3.***
INFORMATION DOCUMENTED: • Cancer toxicity information (values and units) for special case chemicals • The date and source of the toxicity information.	
GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE: • Table 6.3 does not replace toxicological profiles for the individual chemicals that will be presented in the risk assessment.	***It may be necessary to refer to RAGS, the risk assessment technical approach, and EPA Regional guidance to complete the table.***
HOW TO COMPLETE/INTERPRET THE TABLE	
Column 1 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the names of the chemicals that were selected as COPCs from Table 2.	***Chemicals may be grouped in the order that the risk assessor chooses.***
Column 2 - Toxicity Value	
Definition: • The toxicity value for each chemical of potential concern.	
Instructions: • Enter the toxicity value for each chemical of potential concern.	

INSTRUCTIONS FOR TABLE 6.3

CANCER TOXICITY DATA - SPECIAL CASE CHEMICALS (continued)

Column 3 - Toxicity Units	
Definition: • The units associated with the toxicity value.	
Instructions: • Enter the toxicity units.	***Typically (mg/kg-day)$^{-1}$*** ***Refer to Regional guidance to determine if there is a preference regarding the units to be used.***
Column 4 -Source	
Definition: • A reference for the cancer toxicity information.	
Instructions: • Enter the reference for toxicity information.	***IRIS*** ***HEAST*** ***NCEA***
Column 5 - Date (MM/DD/YY)	
Definition: • The date of the document that was consulted for the cancer toxicity data in the MM/DD/YY format.	***The MM/DD/YY format refers to month/day/year.***
Instructions: • Enter the date in MM/DD/YY format. Use a comma to delineate between multiple dates, if multiple sources of information were used. • ***For IRIS references, provide the date IRIS was selected.*** • ***For HEAST references, provide the date of the HEAST reference.*** • ***For NCEA references, provide the date of the article provided by NCEA.***	***For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS

PURPOSE OF THE TABLE: • To provide a summary of the variables used to calculate non-cancer hazards • To show the EPC (medium-specific or route-specific) and intake used in the non-cancer hazard calculations • To present the result of the calculation for each exposure route/pathway for each COPC • To provide the total hazard index for all exposure routes/pathways for the scenario timeframe, exposure medium, and receptor presented in this table.	***The medium-specific or Medium EPC is the same for a particular medium regardless of exposure route.*** ***The route-specific or Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route.***
INFORMATION DOCUMENTED: • The non-cancer hazard quotient for each COPC for each exposure route/pathway • The values used for EPC, non-cancer intake, reference doses, and reference concentrations.	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 7 for each unique combination of the following six fields that will be quantitatively evaluated (Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, and Receptor Age). • Enter each combination of these six fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 7.1 and ending with 7.n where "n" represents the total number of combinations of the six key fields. • Different tables should be prepared to address RME and CT non-cancer hazard calculations. • Tables 7.1.RME through 7.n.RME should be completed for RME non-cancer hazard calculations. • Tables 7.1.CT through 7.n.CT should be completed for CT non-cancer hazard calculations.	***It is possible that some tables may contain some of the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***In the example Standard Tables, the sediment EPC values in Tables 7.4.RME through 7.7.RME may be the same. However the intakes vary due to differences in the Scenario Timeframes and Receptor Ages.*** ***Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS (continued):

For the example data provided, there should be seven copies of Table 7 for the RME calculations, numbered 7.1.RME through 7.7.RME. Seven corresponding tables should be prepared for CT calculations, numbered 7.1.CT through 7.7.CT.

Table Number	*Scenario Timeframe*	*Medium*	*Exposure Medium*	*Exposure Point*	*Receptor Population*	*Receptor Age*
7.1.RME	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Adult*
7.2..RME	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Child*
7.3.RME	*Current*	*Groundwater*	*Air*	*Aquifer 1-- Water Vapors at Showerhead*	*Resident*	*Adult*
7.4.RME	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
7.5.RME	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*
7.6.RME	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
7.7.RME	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE:

- All table entries with the exception of route EPC, intake, and non-cancer hazard are presented on tables preceding Table 7.
- With the exception of modeled intakes, the intake value is the result of calculations performed using parameters and equations presented in Table 4 and concentrations presented in Table 3.
- The total non-cancer hazard for each exposure route is to be summed and the total non-cancer hazard for all exposure pathways is to be presented as a sum at the end of the table.
- This value represents the non-cancer hazard of the various exposure routes/pathways combined.

Medium EPC and Route EPC Examples for Frequently Evaluated Pathways

Medium	*Exposure Medium*	*Exposure Route*	*Medium EPC*	*Route EPC*	*EPC Selected For Calculation*
Groundwater	*Groundwater*	*Ingestion*	*Measured*	*Measured*	*M*
Groundwater	*Groundwater*	*Dermal*	*Measured*	*Modeled*	*R*
Groundwater	*Air*	*Inhalation*	*Measured*	*Modeled*	*R*
Soil	*Soil*	*Ingestion*	*Measured*	*Measured*	*M*
Soil	*Soil*	*Dermal*	*Measured*	*Modeled*	*R*
Soil	*Air*	*Inhalation*	*Measured*	*Modeled* [1]	*R*

[1]EPC's will be modeled separately for particulates and vapors.
Measured - Developed from a statistical derivation of measured data.
Modeled - Developed from model based on measured data.
M - Medium EPC R - Route EPC

The medium-specific or Medium EPC is the same for a particular medium regardless of exposure route.

The route-specific or Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route.

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) which has been contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
Row 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table not to exceed 80 characters).	***The text in the Table can not exceed 80 characters.***
Row 5 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***
Row 6 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the EPA Region or dictated by the site.	***For example, an adult (receptor age) resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Exposure Route	
Definition: • The way a chemical comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Enter the exposure route considered from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined*** **(i.e., Inhalation and Ingestion)** ***Dermal Absorption*** ***Not Documented*** ***External (Radiation)***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Column 2 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the COPCs selected from the COPC screening.	***Table 2 documents COPC screening.***
Column 3 - Medium EPC Value	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another. ***For example,*** ***the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the Medium EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data.***
Instructions: • Enter the medium EPC value for each COPC.	***Table 3 documents medium EPC calculations for RME and CT.***
Column 4 - Medium EPC Units	
Definition: • The units associated with the medium EPC value.	
Instructions: • Enter the units for medium EPC values.	***The units may vary depending on the medium.***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Column 5 - Route EPC Value	
Definition: • The EPC, based on either a statistical derivation of measured data or based on modeled data, that was selected to represent the route-specific concentration for the exposure calculations. The Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route. ***For example,*** ***for groundwater ingestion, the Medium EPC and the Route EPC will typically be the same value. Alternatively, for groundwater inhalation, the Medium EPC will often be a statistical derivation of measured concentrations in groundwater, while the Route EPC will often be a modeled inhalation concentration that is based on the measured concentrations.***	***The Route EPC may be developed from a statistical derivation of measured data or from modeled data. The Route EPC may be identical to the Medium EPC or it may be modeled based on the Medium EPC.***
Instructions: • Enter the route EPC value for each COPC.	***Supporting information should be provided documenting Route EPC calculations.***
Column 6 - Route EPC Units	
Definition: • The units associated with the route EPC value.	***The units may vary depending on the route of exposure.***
Instructions: • Enter the units for route EPC values.	
Column 7 - EPC Selected for Hazard Calculation	
Definition: • The EPC that will be used to quantify potential non-cancer hazards.	
Instructions: • Identify the type of EPC used for non-cancer hazard calculation for each COPC for each exposure route. • Enter "M" for medium EPC. • Enter "R" for route EPC.	***M* (Medium EPC)** ***R* (Route EPC)** ***Follow Regional guidance for selection of this value.***

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Column 8 - Intake (Non-Cancer)	
Definition: • A measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time.	***Refers to the intake results using the parameters and equations, calculations and/or models presented in Table 4.***
Instructions: • Enter the result of the intake calculations/modeling performed for each COPC and exposure route.	***The intake equations, calculations, and/or models are documented in Table 4.***
Column 9 - Intake Units (Non-Cancer)	
Definition: • The units for intake for each COPC and exposure route.	
Instructions: • Enter the units from the intake calculation for each COPC which corresponds to each exposure route.	
Column 10 - Reference Dose	
Definition: • The preferred toxicity value for evaluating non-cancer effects resulting from exposures.	
Instructions: • Enter the reference dose for each COPC which corresponds to each exposure route. • Enter Oral RfD values for ingestion. • Enter Adjusted Dermal RfD values for dermal. • Enter Adjusted Inhalation RfD values for inhalation.	***The reference doses for each COPC are presented in Table 5.***
Column 11 - Reference Dose Units	
Definition: • The units associated with the reference dose.	***Typically reported in mg/kg-day, a dose term.***
Instructions: • Enter the reference dose units for each COPC for each exposure route. • Specify if the reference dose is subchronic by using a footnote.	

INSTRUCTIONS FOR TABLE 7.1

CALCULATION OF NON-CANCER HAZARDS (continued)

Column 12 - Reference Concentration	
Definition: • The toxicity value for inhalation typically reported as a concentration in air (mg/m^3) which can be converted to an inhaled dose (mg/kg-day).	
Instructions: • Enter the reference concentration for each COPC which corresponds to each exposure route.	
Column 13 - Reference Concentration Units	
Definition: • The units associated with the reference concentration.	
Instructions: • Enter the reference concentration units for each COPC for each exposure route.	
Column 14 - Hazard Quotient	
Definition: • The ratio of a single substance exposure level, over a specified time period, to a reference dose for that substance, derived from a similar exposure period.	
Instructions: • Enter the result of the hazard quotient calculation for each COPC. • Sum the hazard quotient for each exposure route/pathway. • Sum the hazard quotients for all exposure routes/pathways.	***The Hazard Index represents the total non-cancer hazard for all exposure routes/pathways presented in this table.***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS

PURPOSE OF THE TABLE: • To provide a summary of the variables used to calculate cancer risks • To show the EPC (medium-specific or route-specific) and intake used in the cancer risk calculations • To present the result of the calculation for each exposure route/pathway for each COPC • To provide the total cancer risks for all exposure routes/pathways for the scenario timeframe, exposure medium, and receptor presented in this table.	***The medium-specific or Medium EPC is the same for a particular medium regardless of exposure route.*** ***The route-specific or Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route.***
INFORMATION DOCUMENTED: • The cancer risk value for each COPC for each exposure route/pathway • The values used for EPC, cancer intake, and cancer slope factor for each COPC for each exposure route.	
TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS: • Complete one copy of Table 8 for each unique combination of the following six fields that will be quantitatively evaluated (Scenario Timeframe, Medium, Exposure Medium, Exposure Point, Receptor Population, and Receptor Age). • Enter each combination of these six fields in the Summary Box in the upper left corner of the table. • Number each table uniquely, beginning with 8.1 and ending with 8.n where "n" represents the total number of combinations of the six key fields. • Different tables should be prepared to address RME and CT cancer risk calculations. • Tables 8.1. RME through 8.n. RME should be completed for RME cancer risk calculations. • Tables 8.1. CT through 8.n. CT should be completed for CT cancer risk calculations.	***It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.*** ***In the example Standard Tables, the sediment EPC values in Tables 8.4.RME through 8.7.RME may be the same. However the intakes may vary due to differences in the Scenario Timeframes and Receptor Ages.*** ***Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS (continued):

For the example data provided, there should be seven copies of Table 8 for the RME calculations, numbered 8.1.RME through 8.7.RME. Seven corresponding tables should be prepared for CT calculations, numbered 8.1.CT through 8.7.CT.

Table Number	*Scenario Timeframe*	*Medium*	*Exposure Medium*	*Exposure Point*	*Receptor Population*	*Receptor Age*
8.1.RME	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Adult*
8.2.RME	*Current*	*Groundwater*	*Groundwater*	*Aquifer 1-- Tap Water*	*Resident*	*Child*
8.3.RME	*Current*	*Groundwater*	*Air*	*Aquifer 1-- Water Vapors at Showerhead*	*Resident*	*Adult*
8.4.RME	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
8.5.RME	*Current*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*
8.6.RME	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Adult*
8.7.RME	*Future*	*Sediment*	*Animal Tissue*	*Trout from Dean's Creek*	*Fisher*	*Child*

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE:

- All table entries with the exception of intake and cancer risk are presented on tables preceding Table 8.
- With the exception of modeled intakes, the intake value is the result of calculations performed using parameters and equations presented in Table 4 and concentrations presented in Table 3.
- The total cancer risk for each exposure route is to be summed and the total cancer risk for all exposure pathways is to be presented as a sum at the end of the table. This value represents the cancer risk of the various exposure routes/pathways combined.

The medium-specific or Medium EPC is the same for a particular medium regardless of exposure route.

The route-specific or Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route.

Medium EPC and Route EPC Examples for Frequently Evaluated Pathways

Medium	*Exposure Medium*	*Exposure Route*	*Medium EPC*	*Route EPC*	*EPC Selected For Calculation*
Groundwater	*Groundwater*	*Ingestion*	*Measured*	*Measured*	*M*
Groundwater	*Groundwater*	*Dermal*	*Measured*	*Modeled*	*R*
Groundwater	*Air*	*Inhalation*	*Measured*	*Modeled*	*R*
Soil	*Soil*	*Ingestion*	*Measured*	*Measured*	*M*
Soil	*Soil*	*Dermal*	*Measured*	*Modeled*	*R*
Soil	*Air*	*Inhalation*	*Measured*	*Modeled* [1]	*R*

[1]EPC's will be modeled separately for particulates and vapors.
Measured - Developed from a statistical derivation of measured data.
Modeled - Developed from model based on measured data.
M - Medium EPC R - Route EPC

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) which has been contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Row 3 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***
Row 4 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	***The text in the Table can not exceed 80 characters***
Row 5 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***
Row 6 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the EPA Region or dictated by the site.	***For example, an adult (receptor age) resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Exposure Route	
Definition: • The way a chemical comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	
Instructions: • Enter the exposure route considered from the picklist to the right.	***Inhalation*** ***Ingestion*** ***Combined*** **(i.e., Inhalation and Ingestion)** ***Dermal Absorption*** ***Not Documented*** ***External (Radiation)***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Column 2 - Chemical of Potential Concern	
Definition: • Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	
Instructions: • Enter the COPCs selected from the COPC screening.	***Table 2 documents COPC screening.***
Column 3 - Medium EPC Value	
Definition: • The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another. ***For example,*** ***the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the MediumEPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data.***
Instructions: • Enter the medium EPC value for each COPC.	***Table 3 documents medium EPC calculations for RME and CT.***
Column 4 - Medium EPC Units	
Definition: • The units associated with the medium EPC value.	
Instructions: • Enter the units for medium EPC values.	***The units may vary depending on the medium.***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Column 5 - Route EPC Value	
Definition: • The EPC, based on either a statistical derivation of measured data or based on modeled data, that was selected to represent the route-specific concentration for the exposure calculations. The Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route. ***For example,*** ***for groundwater ingestion, the Medium EPC and the Route EPC will typically be the same value. Alternatively, for groundwater inhalation, the Medium EPC will often be a statistical derivation of measured concentrations in groundwater, while the Route EPC will often be a modeled inhalation concentration that is based on the measured concentrations.***	***The Route EPC may be developed from a statistical derivation of measured data or from modeled data. The Route EPC may be identical to the Medium EPC or it may be modeled based on the Medium EPC.***
Instructions: • Enter the route EPC value for each COPC.	***Supporting information should be provided documenting Route EPC calculations.***
Column 6 - Route EPC Units	
Definition: • The units associated with the route EPC value.	***The units may vary depending on route of exposure.***
Instructions: • Enter the units for route EPC values.	
Column 7 - EPC Selected for Risk Calculation	
Definition: • The EPC that will be used to quantify potential cancer risks.	
Instructions: • Identify the type of EPC used for cancer risk calculations for each COPC for each exposure route. • Enter "M" for medium EPC. • Enter "R" for route EPC.	***M* (Medium EPC)** ***R* (Route EPC)** ***Follow Regional guidance for selection of this value.***

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Column 8 - Intake (Cancer)	
Definition: • A measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time (e.g. mg chemical/kg body weight/day).	***Refers to the intake result using the parameters and equations/calculations, and or models presented in Table 4.***
Instructions: • Enter the result of the intake calculations/modeling performed for each COPC and exposure route.	***The intake calculations and/or models are documented in Table 4.***
Column 9 - Intake Units (Cancer)	
Definition: • The units for intake for each COPC and exposure route.	
Instructions: • Enter the units from the intake calculation for each COPC which corresponds to each exposure route.	
Column 10 - Cancer Slope Factor	
Definition: • A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. Usually the cancer slope factor is the upper 95th % confidence limit of the dose-response curve.	
Instructions: • Enter the cancer slope factor for each COPC which corresponds to each exposure route.	***The slope factors for each COPC are presented in Table 6.***
Column 11 - Cancer Slope Factor Units	
Definition: • Usually, the cancer slope factor is the upper 95th % confidence limit of the dose-response curve and is expressed as $(mg/kg\text{-}day)^{-1}$.	
Instructions: • Enter the cancer slope factor units for each COPC for each exposure route.	

INSTRUCTIONS FOR TABLE 8.1

CALCULATION OF CANCER RISKS (continued)

Column 12 - Cancer Risk	
Definition: • The result of the cancer risk calculation for each COPC for each exposure route and pathway.	
Instructions: • Enter the cancer risk calculation for each COPC. • Sum the cancer risk results for each exposure route/pathway. • Sum the total cancer risk results for all exposure routes/pathways.	***The sum of all exposure routes represents the total cancer risk for all exposure routes/ pathways.***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

PURPOSE OF THE TABLE:

- To provide a summary for each receptor by medium, exposure route, and exposure point of cancer risks and non-cancer hazards.

Table 9 presents cancer risk and non-cancer hazard information for all COPCs and media/exposure points quantitatively evaluated.

INFORMATION DOCUMENTED:

- The cancer risk and non-cancer hazard to each receptor for each COPC by exposure route, and exposure point
- The total cancer risk and non-cancer hazard for each exposure pathway
- The total cancer risk and non-cancer hazard for each medium across all exposure routes
- The primary target organs for non-carcinogenic hazard effects.

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS:

- Complete one copy of Table 9 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age).
- Enter each combination of these three fields in the Summary Box in the upper left corner of the table.
- Number each table uniquely beginning with 9.1 and ending with 9.n where "n" represents the total number of combinations of the three key fields.
- Different tables should be prepared to address RME and CT Risk and Hazard summaries.
- Tables 9.1. RME through 9.n. RME should be completed for RME Risk and Hazard summaries.
- Table 9.1.CT through 9.n.CT should be completed for CT Risk and Hazard Summaries.

It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.

Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.

For the example data provided, there should be six copies of Table 9 for the RME calculations, numbered 9.1.RME through 9.6.RME. Six corresponding tables should be prepared for CT calculations, numbered 9.1.CT through 9.6.CT.

Table Number	*Scenario Timeframe*	*Receptor Population*	*Receptor Age*
9.1.RME	*Current*	*Resident*	*Adult*
9.2.RME	*Current*	*Resident*	*Child*
9.3.RME	*Current*	*Fisher*	*Adult*
9.4.RME	*Current*	*Fisher*	*Child*
9.5.RME	*Future*	*Fisher*	*Adult*
9.6.RME	*Future*	*Fisher*	*Child*

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE:	
• Cancer risk and non-cancer hazard information for all COPCs and media/exposure points quantitatively evaluated is to be presented in Table 9. • All table entries are presented on Tables preceding Table 9. • Documentation of the non-cancer hazard values was presented on Table 7. • Documentation of the carcinogenic risk values was presented on Table 8. • Total cancer risks and non-cancer hazards associated with each receptor are to be presented for each exposure point, across all media and all exposure routes, and for each individual medium.	
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Row 2 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer, Jogger, Fisher*** ***Hunter, Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/ Playground*** ***Trespasser/Visitor*** ***Farmer, Gardener*** ***Other***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the Region or dictated by the site.	***For example, an adult (receptor age) resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) which has been contaminated.	
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Column 2 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors***
Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	
Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	***The text in the Table can not exceed 80 characters.***
Column 4 - Chemical	
Definition: • The COPCs quantitatively considered in the risk characterization. • The last entry in this column is the term "Total" which refers to a row of totals for the four columns.	
Instructions: • Enter the COPCs from previous tables. • Enter the term "Total" at the end of the list of chemicals for each exposure point.	

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Columns 5, 6, and 7 - Carcinogenic Risk - Ingestion, Inhalation, Dermal	
Definition: • The cancer risk value calculated by receptor for each COPC for each exposure route for each exposure point.	***The value at the bottom of each column presents the cancer risk by exposure route for each exposure point.***
Instructions: • Enter the cancer risk value calculated by receptor for each exposure route for each exposure point. • Enter the cancer risk totals for each exposure route in the last row, corresponding to the term "Total" in Column 4.	
Column 8 - Carcinogenic Risk - Exposure Routes Total	
Definition: • The total cancer risk for each COPC across all exposure routes at each exposure point.	
Instructions: • Enter the sum of cancer risks across the three exposure routes for Columns 5, 6, and 7. • Enter the sum of the cancer risks across exposure routes for each COPC. • Enter the sum of the cancer risks in this column for each exposure point. • Enter the total cancer risk across all media and all exposure routes. • Enter the total cancer risk for each individual medium.	
Column 9 - Chemical	
Definition: • The COPCs quantitatively considered in the risk characterization. • The last entry in this column is the term "Total" which refers to a row of Totals for Columns 11, 12, 13 and 14.	
Instructions: • Enter the COPCs from previous tables. • Enter the term "Total" at the end of the list of chemicals for each exposure point.	

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Column 10 - Non-Carcinogenic Hazard Quotient - Primary Target Organ	
Definition: • The primary effect reported as a primary target organ effect in IRIS and HEAST.	
Instructions: • Enter the primary target organ effect as reported in IRIS and/or HEAST.	***Refer to Regional guidance to determine if multiple effects should be provided.***
Columns 11, 12, and 13 - Non-Carcinogenic Hazard Quotient - Ingestion, Inhalation, Dermal	
Definition: • The non-cancer hazard calculated by receptor for each COPC for each exposure route for each exposure point.	***The value at the bottom of each column presents the non-cancer hazard by exposure route for each exposure point, for all effects considered together.***
Instructions: • Enter the non-cancer hazard value calculated by receptor for each COPC for each exposure route for each exposure point. • Enter the non-cancer hazard totals for each exposure route in last row, corresponding to the term "Total" in Column 9.	***Refer to Regional guidance for summing hazard quotients.***
Column 14 - Non-Carcinogenic Hazard Quotient - Exposure Routes Total	
Definition: • The total non-cancer hazard calculated for each COPC across all exposure routes at each exposure point.	***The Totals in each column present the total non-cancer hazards across all exposure routes for each exposure point. The values at the bottom of this column present hazard quotients for target organs.***

INSTRUCTIONS FOR TABLE 9

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs (continued)

Instructions: • Enter the sum of non-cancer hazards across the three exposure routes in Columns 11, 12, and 13. • Enter the sum of the non-cancer hazards across exposure routes for each COPC and primary target organ. • Enter the sum of the non-cancer hazards in this column for each exposure point. • Enter the total hazard index across all media and all exposure routes. • Enter the total hazard index for primary target organs. • Sum the hazard quotient target organ effects by target organ and enter into the appropriate boxes.	***Refer to Regional guidance for specific instructions in summing hazard quotients.***

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY

PURPOSE OF THE TABLE: • To provide a summary for each receptor by medium, exposure route, and exposure point of cancer risks and non-cancer hazards that trigger the need for cleanup. • *The Risk Assessor should consult the Project Manager to determine what levels of risk may be actionable at the site. The risks shown on Table 10 should be based upon the Project Manager's recommendation. If all risks are below actionable levels, determine with the Project Manager which chemicals should be shown to document the suitability of a No Action decision.*	***Table 10 presents cancer risk and non-cancer hazard information for those COPCs and media/exposure points that trigger the need for cleanup (the risk drivers).***
INFORMATION DOCUMENTED: • The cancer risk and non-cancer hazard to each receptor for each COPC by exposure route and exposure point • The total cancer risk and non-cancer hazard for each exposure pathway for risk drivers • The cancer risk and non-cancer hazard for each medium across all exposure routes for risk drivers • The primary target organs for non-carcinogenic hazard effects.	

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS:

- Complete one copy of Table 10 for each unique combination of the following three fields that will be quantitatively evaluated (Scenario Timeframe, Receptor Population, and Receptor Age).
- Enter each combination of these three fields in the Summary Box in the upper left corner of the table.
- Number each table uniquely beginning with 10.1 and ending with 10.n where "n" represents the total number of combinations of the three key fields.
- Different tables should be prepared to address RME and CT Risk and Hazard summaries.
- Tables 10.1. RME through 10.n. RME should be completed for RME Risk and Hazard summaries.
- Table 10.1 CT through 10.n.CT should be completed for CT Risk and Hazard Summaries.

It is possible that some tables may contain the same data associated with different descriptions in the Summary Box in the upper left corner.

Separate tables are necessary to ensure transparency in data presentation and appropriate information transfer to CERCLIS 3 for each exposure pathway. Replication of information is readily accomplished using spreadsheet software.

TABLE NUMBERING AND SUMMARY BOX INSTRUCTIONS (continued):

For the example data provided, there should be six copies of Table 10 for the RME calculations, numbered 10.1.RME through 10.6.RME. Six corresponding tables should be prepared for CT calculations, numbered 10.1.CT through 10.6.CT.

Table Number	*Scenario Timeframe*	*Receptor Population*	*Receptor Age*
10.1.RME	*Current*	*Resident*	*Adult*
10.2.RME	*Current*	*Resident*	*Child*
10.3.RME	*Current*	*Fisher*	*Adult*
10.4.RME	*Current*	*Fisher*	*Child*
10.5.RME	*Future*	*Fisher*	*Adult*
10.6.RME	*Future*	*Fisher*	*Child*

GENERAL NOTES/INSTRUCTIONS FOR THIS TABLE

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

• Cancer risk and non-cancer hazard information for only those COPCs and media/exposure points that trigger the need for cleanup (the risk drivers) is to be presented in Table 10. • All table entries are presented on Tables preceding Table 10. • Documentation of the non-cancer hazard values was presented on Table 7. • Documentation of the carcinogenic risk values was presented on Table 8. • Total cancer risks and non-cancer hazards associated with each receptor are to be presented for each exposure point, across all media and all exposure routes, and for each individual medium.	
HOW TO COMPLETE/INTERPRET THE TABLE	
SUMMARY BOX IN UPPER LEFT CORNER	
Row 1 - Scenario Timeframe	
Definition: • The time period (current and/or future) being considered for the exposure pathway.	
Instructions: • Choose from the picklist to the right.	***Current*** ***Future*** ***Current/Future*** ***Not Documented***

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

Row 2 - Receptor Population	
Definition: • The exposed individual relative to the exposure pathway considered.	***For example, a resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***
Row 3 - Receptor Age	
Definition: • The description of the exposed individual, as defined by the Region or dictated by the site.	***For example, an adult (receptor age) resident (receptor population) who drinks contaminated groundwater.***
Instructions: • Choose from the picklist to the right.	***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Other*** ***Infant*** ***Toddler*** ***Pregnant***
BODY OF THE TABLE	
Column 1 - Medium	
Definition: • The environmental substance (e.g., air, water, soil) which has been contaminated.	***Enter only the media that have risks or hazards exceeding target levels.***

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil***
Column 2 - Exposure Medium	
Definition: • The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example:*** ***1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	***Enter only the exposure media that have risks or hazards exceeding target levels.***
Instructions: • Choose from the picklist to the right.	***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge, Soil*** ***Surface Water*** ***Debris*** ***Other*** ***Liquid Waste*** ***Solid Waste*** ***Air , Vapors*** ***Plant Tissue*** ***Animal Tissue*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Spring Water***
Column 3 - Exposure Point	
Definition: • An exact location of potential contact between a person and a chemical within an exposure medium. ***For example:*** ***1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated.*** ***2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated.*** ***3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout in Dean's Creek (the Exposure Point) is evaluated.***	***Enter only the exposure points that have risks or hazards exceeding target levels.***

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

Instructions: • Provide the information as text in the Table (not to exceed 80 characters).	***The text in the Table can not exceed 80 characters.***
Column 4 - Chemical	
Definition: • The COPCs quantitatively considered in the risk characterization. • The last entry in this column is the term "Total" which refers to a row of totals for the four columns.	***Enter only the chemicals that have risks exceeding target levels.***
Instructions: • Enter the COPCs from previous tables that exceed target levels. • Enter the term "Total" at the end of the list of chemicals for each exposure point.	
Columns 5, 6, and 7 - Carcinogenic Risk - Ingestion, Inhalation, Dermal	
Definition: • The cancer risk value calculated by receptor for each COPC for each exposure route for each exposure point.	***Enter only the risks that exceed target levels.*** ***The value at the bottom of each column presents the cancer risk by exposure route for each exposure point.***
Instructions: • Enter the cancer risk value calculated by receptor for each COPC for each exposure route for each exposure point that exceeds target levels. • Enter the cancer risk totals for each exposure route in the last row, corresponding to the term "Total" in Column 4.	
Column 8 - Carcinogenic Risk - Exposure Routes Total	
Definition: • The total cancer risk for each COPC across all exposure routes at each exposure point.	

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

Instructions: • Enter the sum of cancer risks across the three exposure routes for Columns 5, 6, and 7. • Enter the sum of the cancer risks across exposure routes for each COPC. • Enter the sum of the cancer risks in this column for each exposure point. • Enter the total cancer risk across all media and all exposure routes. • Enter the total cancer risk for each individual medium.	
Column 9 - Chemical	
Definition: • The COPCs quantitatively considered in the hazard characterization. • The last entry in this column is the term "Total" which refers to a row of Totals for Columns 11, 12, 13 and 14.	***Enter only the chemicals that have hazards exceeding target levels.***
Instructions: • Enter the COPCs from previous tables with hazards exceeding target levels. • Enter the term "Total" at the end of the list of chemicals for each exposure point.	
Column 10 - Non-Carcinogenic Hazard Quotient - Primary Target Organ	
Definition: • The primary effect reported as a primary target organ effect in IRIS and HEAST.	***Enter only the target organs that have hazards exceeding target levels.***
Instructions: • Enter the primary target organ effect as reported in IRIS and/or HEAST.	***Refer to Regional guidance to determine if multiple effects should be provided.***
Columns 11, 12, and 13 - Non-Carcinogenic Hazard Quotient - Ingestion, Inhalation, Dermal	
Definition: • The non-cancer hazard calculated by receptor for each COPC for each exposure route for each exposure point.	***Enter only the hazards that exceed target levels.*** ***The value at the bottom of each column presents the non-cancer hazard by exposure route for each exposure point, for all effects considered together.***

INSTRUCTIONS FOR TABLE 10

RISK ASSESSMENT SUMMARY (continued)

Instructions: • Enter the non-cancer hazard value calculated by receptor for each COPC for each exposure route for each exposure point that exceeds target levels. • Enter the non-cancer hazard totals for each exposure route in the last row, corresponding to the term "Total" in Column 9.	***Refer to Regional guidance for summing hazard quotients.***
Column 14 - Non-Carcinogenic Hazard Quotient - Exposure Routes Total	
Definition: • The total non-cancer hazard calculated for each COPC across all exposure routes at each exposure point.	***The Totals in each column present the total non-cancer hazards across all exposure routes for each exposure point.*** ***The values at the bottom of this column present hazard quotients for target organs.***
Instructions: • Enter the sum of non-cancer hazards across the three exposure routes in Columns 11, 12, and 13. • Enter the sum of the non-cancer hazards across exposure routes for each COPC and primary target organ. • Enter the sum of the non-cancer hazards in this column for each exposure point. • Enter the total hazard index across all media and all exposure routes. • Enter the total hazard index for primary target organs. • Sum the hazard quotient target organ effects by target organ and enter into the appropriate boxes.	***Refer to Regional guidance for specific instructions in summing hazard quotients.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Adjusted Dermal RfD (5.1)	The adjusted reference dose (RfD) for each cehmical of potential concern detected which is derived from the oral RfD.	***Derivations of the adjusted dermal RfD should be performed in accordance with Regional guidance.***
Adjusted Dermal Cancer Slope Factor (6.1)	The dermal cancer slope factor for each chemical of potential concern, which typically is derived from the oral cancer slope factor.	***Derivation of the dermal cancer slope factor should be performed in accordance with Regional guidance.***
Adjusted Inhalation RfD (5.2)	The inhalation RfD for each chemical of potential concern which is derived from the reference concentration (RfC) value.	***The derivation of the RfD from RfC should be performed in accordance with Regional guidance.***
Adjustment (6.2)	The value used to derive the inhalation cancer slope factor from the unit risk value.	***Toxicity values for carcinogenic effects also can be expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. These measures are called unit risks and can be calculated from cancer slope factors.***
Arithmetic Mean (3)	The arithmetic average of detected concentrations.	
Background Value (2)	The background value for the chemical in that medium as defined by Regional guidance.	***Refer to Regional guidance for how background values are determined and how background values are considered for COPC screening. If Regional guidance requires a "t-test" or other test which requires backup information, this information should be presented. A footnote should be added to this column to clarify the Regional method used for background. (e.g., literature value, data from a nearby site, statistical tool).***
Cancer Risk (8)	The result of the cancer risk calculation for each COPC for each exposure route and pathway.	
Cancer Slope Factor (8)	A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. Usually, the cancer slope factor is the upper 95th % confidence limit of the dose-response curve.	***Slope factors presented in Table 6 for each COPC are the same as cancer slope factors presented in Table 8.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Cancer Slope Factor Units (8)	Usually, the cancer slope factor is the upper 95th % confidence limit of the dose-response curve and is expressed as $(mg/kg\text{-}day)^{-1}$.	
Carcinogenic Risk (Ingestion, Inhalation, Dermal) (9,10)	The cancer risk value calculated by receptor for each COPC for each exposure route for each exposure point.	***The value at the bottom of each column presents the cancer risk by exposure route for each exposure point.***
Carcinogenic Risk (Exposure Routes Total) (9)	The total cancer risk for each COPC across all exposure routes at each exposure point.	
CAS Number (2)	The Chemical Abstract Registry Number, a unique standardized number which is assigned to chemicals.	***Provide CAS Number for chemicals detected in the samples for the medium.***
Central Tendency (CT) (3)	Risk calculations which result from using less conservative methodologies, instead of reasonable maximum methodologies.	***Refer to Regional guidance.***
CT Rationale/Reference (4)	The reason and reference for the parameter value used. If the parameter used is inconsistent with guidance values, provide a detailed explanation of the rationale and a complete reference for the value used.	***Refer to Regional or National guidance for intake parameter values appropriate for each exposure pathway.***
CT Value (4)	The parameter value used for the central tendency exposure intake calculation.	
Chemical (2)	The name of the compound detected in samples for the medium.	***Chemicals can be arranged in the order that the risk assessor prefers.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Chemicals of Potential Concern (COPC) (3,5.1,5.2,5.3,6.1,6.2, 6.3,7,8)	Chemicals that are potentially site-related, with data of sufficient quality, that have been retained for quantitative analysis as a result of the screening documented in Table 2.	***Provide the chemical name of the COPC based on the results of the screening documented in Table 2. Chemicals can be arranged in the order that the risk assessor prefers.***
COPC Flag (2)	A code which identifies whether the chemical has been selected as a COPC, based on Regional screening guidance.	***Yes*** ***No***
Chronic/Subchronic (5.1,5.2,5.3)	Identifies whether the RfD for a particular chemical is for chronic (long-term) and/or subchronic (short-term) exposure.	***The risk assessor should use professional judgement when extrapolating to time-frames shorter or longer than those employed in any crticial study referenced. As a Superfund program guide-line, chronic is seven years to a lifetime; subchronic is two weeks to seven years (RAGS Part A, Sections 6 and 8).***
Combined Uncertainty/ Modifying Factors (5.1,5.2,5.3)	The factors applied to the critical effect level to account for areas of uncertainty inherent in extrapolation from available data.	***Refer to IRIS/HEAST for these values. Examples of uncertainty to be addressed include:*** ***- variations in the general population*** ***- interspecies variability between humans and animals*** ***- use of subchronic data for chronic evaluation*** ***- extrapolation from LOAELs to NOAELs.***
Concentrations Used For Screening (2)	The detected concentration which was used to compare to the screening value.	***Refer to Regional guidance in determining this value. For example, maximum or average values.***
Date (MM/DD/YY) (5,6)	The date of the document that was consulted for the toxicity and target organ information.	***The MM/DD/YY format refers to month/day/year. For example, the MM/DD/YY version of the date March 30, 1995 is 03/30/95.***
Dermal (9,10)	The predicted route of chemical exposure through the skin.	
Detection Frequency (2)	The number of times the chemical was detected versus the number of times it was analyzed, expressed as the "fraction" X/Y.	***Refer to Regional guidance for an explanation of how detection frequency should be interpreted and applied. For example, 5/9 indicates that a chemical was detected in 5 out of 9 samples.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Exposure Medium (1,2,3,4,7,8,9,10)	The contaminated environmental medium to which an individual is exposed. Includes the transfer of contaminants from one medium to another. ***For example, 1) Contaminants in Groundwater (the Medium) remain in Groundwater (the Exposure Medium) and are available for exposure to receptors. 2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and are available for exposure to receptors. 3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and are available for exposure to receptors.***	***Choose from the following picklist:*** ***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Plant Tissue*** ***Animal Tissue*** ***Spring Water*** ***Surface Soil*** ***Subsurface Soil*** ***Particulates*** ***Vapors*** ***Other***
Exposure Pathway (1)	The course a chemical takes from the source to the exposed individual. An exposure pathway analysis links the sources, locations, and types of environmental releases with population locations and activity patterns to determine the significant pathways of human exposure.	
Exposure Point (1,2,3,4,7,8,9,10)	An exact location of potential contact between a person and a chemical within an exposure medium. ***For example: 1) Contaminants are in Groundwater (the Medium and the Exposure Medium) and exposure to Aquifer 1 - Tap Water (the Exposure Point) is evaluated. 2) Contaminants in Groundwater (the Medium) may be transferred to Air (the Exposure Medium) and exposure to Aquifer 1 - Water Vapors at Showerhead (the Exposure Point) is evaluated. 3) Contaminants in Sediment (the Medium) may be transferred to Animal Tissue (the Exposure Medium) and Trout from Dean's Creek (the Exposure Point) is evaluated.***	***Provide the information as text in the table (not to exceed 80 characters).***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Exposure Point Concentration (EPC) (1,2,3,4,7,8,9,10)	The value that represents a conservative estimate of the chemical concentration available from a particular medium or route of exposure.	***The EPC may be calculated, measured, or modeled.***
EPC Selected for Risk or Hazard Calculation (7,8)	The EPC that will be used to quantify potential cancer risks and non-cancer hazards.	***M (i.e., Medium-Specific EPC)*** ***R (i.e., Route-Specific EPC)*** ***Follow Regional guidance for selection of this value.***
EPC Units (3)	The units of the data being used to calculate the exposure point concentration (EPC).	***Units may vary depending on the environmental medium.***
Exposure Route (1,4,7,8,9,10)	The way a chemical comes in contact with a person (e.g., by ingestion, inhalation, dermal contact).	***Choose from the following picklist:*** ***Inhalation*** ***Ingestion*** ***Combined (i.e., Inhalation/Ingestion)*** ***Dermal Absorption*** ***Not Documented*** ***External (Radiation)***
Exposure Routes Total (9,10)	The arithmetic sum of cancer risk and non-cancer hazards for the COPCs for the exposure point.	***For non-cancer totals, follow Regional guidance.***
Hazard Quotient (7)	The ratio of a single substance exposure level, over a specified time period, to a reference dose for that substance, derived from a similar exposure period.	
Ingestion (9,10)	The route of chemical exposure through eating (ingestion).	
Inhalation (9,10)	The route of chemical exposure through breathing (inhalation).	
Inhalation Cancer Slope Factor (6.2)	A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime.	***Usually the cancer slope factor is the upper 95th % confidence limit of the dose-response curve for inhalation.***
Inhalation RfC Units (5.2)	The RfC units for each chemical detected.	

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Inhalation RfC Value (5.2)	The reference concentration value for each of the COPCs.	
Intake (Cancer) (8)	A measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time (e.g., mg chemical/kg body weight/day).	***Refers to the intake result using the parameters and equations/calculations and/or models presented in Table 4.***
Intake (Non-Cancer) (7)	A measure of exposure expressed as the mass of a substance in contact with the exchange boundary per unit body weight per unit time (e.g., mg chemical/kg body weight/day.	***Refers to the intake result using the parameters and equations/calculations and/or models presented in Table 4.***
Intake (Cancer) Units (8)	The units for intake for each COPC and exposure route.	
Intake (Non-Cancer) Units (7)	The units for intake for each COPC and exposure route.	
Intake Equation/Model Name (4)	The calculation, equation or model used for intake estimates for each exposure route.	
Location of Maximum Concentration (2)	The sample number which identifies the location where the sample was taken.	
Maximum Concentration (2)	The highest detected concentration of the chemical in the medium.	***Refer to RAGS - Part A (EPA, 1989) page 5-8 for guidance on detection/quantification limits.***
Maximum Detected Concentration (3)	The highest detected concentration of the chemical in the medium which is above the sample quantitation limit.	
Maximum Qualifier (2)	The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the maximum concentration value.	

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Medium (1)	The environmental substance (e.g, air, water, soil) originally contaminated.	***Choose from the following picklist:*** ***Groundwater*** ***Leachate*** ***Sediment*** ***Sludge*** ***Soil*** ***Surface Water*** ***Debris*** ***Liquid Waste*** ***Solid Waste*** ***Air*** ***Surface Soil*** ***Subsurface Soil*** ***Other***
Medium EPC Rationale (for RME or CT) (3)	The reason the cited statistic was used to represent the EPC for RME or CT.	
Medium EPC Statistic (for RME or CT) (3)	The statistic selected to represent the Medium EPC Value (RME or CT), based on Regional guidance, the distribution of the data, number of data points, etc.	***Often, this is the 95% Upper Confidence Level (UCL) of the log-transformed data.***
Medium EPC Units (7,8)	The units associated with the Medium EPC Value.	***Units may vary depending on the Medium.***
Medium EPC Value (for RME) (3,7,8)	The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the RME exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another.	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data. For example, the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the Medium EPC value may be selected as a single measured value if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Medium EPC Value (for CT) (3,7,8)	The EPC, based on either a statistical derivation of measured data or modeled data, that was selected to represent the medium-specific concentration for the CT exposure calculations. The Medium EPC differs from the Route EPC in that the Medium EPC does not consider the transfer of contaminants from one medium to another.	***The Medium EPC Value may be developed from a statistical derivation of measured data or from modeled data. For example, the Medium EPC value may be statistically derived by calculating the 95% UCL of measured groundwater contaminant concentrations from multiple residential wells. Alternatively, the Medium EPC value may be selected as a single measured value, if one data point is used to calculate the risk for each residential well individually. In some cases, the Medium EPC value may be a modeled value (e.g., if upgradient groundwater contaminant concentrations are used to model a downgradient exposure point.) Note that none of these examples consider the transfer of contaminants from one medium to another, as is evaluated by Route EPC.***
Minimum Concentration (2)	The lowest detected concentration of the chemical in the medium.	
Minimum Qualifier (2)	The alpha-numeric code assigned to the concentration value by the analytical chemist during data validation for the minimum concentration value.	
Non-Carcinogenic Hazard Quotient (Primary Target Organ) (9,10)	The primary effect reported as a primary target organ effect in IRIS and HEAST.	
Non-Carcinogenic Hazard Quotient (Ingestion, Inhalation, Dermal) (9,10)	The non-cancer hazard calculated by receptor for each COPC for each exposure route for each exposure point.	***The value at the bottom of each column presents the non-cancer hazard by exposure route for each exposure point, for all effects considered together.***
Non-Carcinogenic Hazard Quotient (Exposure Routes Total) (9,10)	The total non-cancer hazard calculated for each COPC across all exposure routes at each exposure point.	***The totals in each column present the total non-cancer hazards across all exposure routes for each exposure point. The values at the bottom of this column present hazard quotients for specific target organs.***
Not Documented (picklist term)	The CERCLIS 3 picklist term used when no information is available.	
On-Site/Off-Site (1)	The location of potential contact between a person and a chemical (contaminant) as it relates to the site boundary.	***Choose from the following picklist:*** ***On-site*** ***Off-site*** ***On-site/Off-site*** ***Not Documented***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Oral Cancer Slope Factor (6.1)	Cancer slope factor for ingestion.	
Oral Reference Dose (RfD) Units (5.1)	The oral reference dose (RfD) units for each COPC.	
Oral RfD Value (5.1)	The oral RfD value for each of the COPCs.	
Oral to Dermal Adjustment Factor (5.1,6.1)	The adjustment factor used to convert the oral RfD values to dermal RfD values.	
Parameter Code (4)	The code used for parameters in the intake equation.	***See the instructions for standard codes. Other codes may be added if appropriate.***
Parameter Definition (4)	The parameters used in the intake equation.	
Potential Applicable or Relevant and Appropriate Requirements and To Be Considered (ARAR/TBC) Source (2)	The type or source of ARAR/TBC value entered into the adjacent column.	***For example,*** ***MCL*** ***SMCL***
Potential ARAR/TBC Value (2)	ARAR/TBC values.	***They could be MCL values, soil cleanup level values, or other values to be considered. Refer to Regional guidance regarding the requirements for this column.***
Primary Target Organ (5.1,5.2,5.3,9,10)	The organ that is affected most (i.e., experiences critical effects) by chronic or subchronic exposure to the specific COPC, and upon which the RfD is based.	
Range of Detection Limits (2)	The lowest and highest detection limits.	***Refer to Regional or National guidance for definitions of detection limits.***
Rationale for Contaminant Deletion/Selection (2)	The reason the chemical was selected or not selected for quantitative or qualitative analysis.	***Follow Regional guidance for the rationale codes.***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Rationale for Selection or Exclusion of Exposure Pathway (1)	The reason the exposure pathway was selected or not selected for quantitative or qualitative analysis.	***Follow Regional guidance for the rationale codes. The narrative in the Table can not exceed 200 characters.***
Reasonable Maximum Exposure (RME) (3)	The highest exposure that is reasonably expected to occur.	
RME Rationale/Reference (4)	The reason and reference for the parameter value used. This rationale may be Regional or National guidance.	***If the parameter used is inconsistent with guidance values, provide a detailed explanation of rationale and a complete reference for the value.***
RME Value (4)	The parameter value used for the RME intake calculation.	
Receptor Age (1)	The description of the exposed individual as defined by the EPA Region or dictated by the site. ***For example, an adult (Receptor Age) resident (Receptor Population) who drinks contaminated groundwater.***	***Choose from the following picklist:*** ***Child*** ***Adult*** ***Adolescents (teens)*** ***Pre-Adolescents*** ***Not Documented*** ***Child/Adult*** ***Geriatric*** ***Sensitive*** ***Infant*** ***Toddler*** ***Pregnant*** ***Other***
Receptor Population (1)	The exposed individual relative to the exposure pathway considered. ***For example, a resident (Receptor Population) who drinks contaminated groundwater.***	***Choose from the following picklist:*** ***Resident*** ***Industrial Worker*** ***Commercial Worker*** ***Construction Worker*** ***Other Worker*** ***Golfer*** ***Jogger*** ***Fisher*** ***Hunter*** ***Fisher/Hunter*** ***Swimmer*** ***Other Recreational Person*** ***Child at School/Daycare/Playground*** ***Trespasser/Visitor*** ***Farmer*** ***Gardener*** ***Other***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Reference Concentration (7)	The toxicity value for inhalation typically reported as a concentration in air (mg/m^3) which can be converted to an inhaled dose (mg/kg-day).	
Reference Concentration Units (7)	The units associated with the reference concentration.	
Reference Dose (RfD) (7)	The preferred toxicity value for evaluating non-cancer effects resulting from exposures.	
RfD or RfC Units (7,8)	The units associated with the RfD or RfC for each COPC.	***Typically reported in mg/kg-day, a dose term.***
Route EPC Units (7,8)	The units associated with the Route EPC Value.	***Units may vary depending on the Route of Exposure.***
Route EPC Value (7,8)	The EPC, based on either a statistical derivation of measured data or based on modeled data, that was selected to represent the route-specific concentration for the exposure calculations. The Route EPC differs from the Medium EPC in that the Route EPC may consider the transfer of contaminants from one medium to another, where applicable for a particular exposure route.	***The Route EPC may be developed from a statistical derivation of measured data or from modeled data. The Route EPC may be identical to the Medium EPC or it may be modeled based on the Medium EPC. For example, for groundwater ingestion, the Medium EPC and the Route EPC will typically be the same value. Alternatively, for groundwater inhalation, the Medium EPC will often be a statistical derivation if measured concentrations in groundwater, while the Route EPC will often be a modeled inhalation concentration that is based on the measured concentrations.***
Scenario Timeframe (1)	The time period (current and/or future) being considered for the exposure pathway.	***Choose from the following picklist:*** ***Current*** ***Future*** ***Current/Future*** ***Not Documented***
Screening Toxicity Value (2)	The screening level used to compare detected concentrations of chemicals.	***Refer to Regional guidance for the source of the screening value and for guidance on comparing the screening value to detected concentrations.***
Source (6.1,6.2,6.3)	A reference for the weight of evidence/cancer guideline description entry.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Source of Toxicity/Primary Target Organ (5.3)	The source of the toxicity value and primary target organ information.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA***
Source of RfD/RfC/Primary Target Organ (5.1,5.2,5.3)	The source of the RfD/RfC and target organ information.	***For example:*** ***IRIS*** ***HEAST*** ***NCEA***
Subchronic (5.1,5.2,5.3)	A short-term (two weeks to seven years) designation.	***As a Superfund program guideline, chronic is seven years to a lifetime; subchronic is two weeks to seven years (RAGS Part A, Sections 6 and 8). The risk assessor should use professional judgement when extrapolating to timeframes shorter or longer than those employed in any crticial study referenced.***
Summary Box (2,3,4,7,8,9,10)	A box in the upper left corner of a Table containing the combination of parameters that define a unique exposure pathway.	***The Summary Box typically specifies the unique combination of Scenario Timeframe, Medium, Exposure Medium, and Exposure Point. For selected tables, the Receptor Population and Receptor Age are presented.***
Total Hazard Index (9,10)	A summation of non-cancer hazards across media and exposure routes.	***Refer to Region-specific guidance on summing toxic endpoint effects.***
Total Risk (9,10)	A summation of cancer risk across media and exposure routes.	
Toxicity Units (5.3,6.3)	The units associated with the toxicity value.	
Type of Analysis (1)	The level of evaluation (quantitative or qualitative) to be performed for the exposure pathway based on site-specific analysis.	***Choose from the following picklist:*** ***Quant (i.e., Quantitative)*** ***Qual (i.e., Qualitative)*** ***None***

GLOSSARY FOR COMPLETION OF STANDARD TABLES

TERM (TABLE LOCATION(S))	DEFINITION	ADDITIONAL INFORMATION
Units (2,3)	The concentration units for each chemical detected.	***Refer to Regional guidance to determine if there is a preference regarding the units used for different matrices (e.g., mg/kg for soil, ug/L for groundwater). Choices include:*** ***mg/l*** ***µg/l*** ***ng/l*** ***pg/l*** ***%*** ***ppm*** ***ppb*** ***ppt*** ***g/kg*** ***mg/kg*** ***µg/kg*** ***ng/kg*** ***µg/g*** ***mg/m³*** ***µg/m³*** ***fibers/l*** ***fibers/m³*** ***fibers/kg*** ***lbs/day*** ***µg/100cm²*** ***mg/cm²*** ***µRem/hr*** ***Rem/yr*** ***pCi/g*** ***pCi/kg*** ***pCi/m³*** ***pCi/l*** ***pCi/m²/sec*** ***Other*** ***Not Documented***
Units (for parameter codes) (4)	The units for the parameter code used in the intake equation.	
Unit Risk (6.2)	Toxicity values for carcinogenic effects expressed in terms of risk per unit concentration of the substance in the medium where human contact occurs. These measures can be calculated from cancer slope factors.	
Toxicity Value (5.3,6.3)	The toxicity value for each of the COPCs.	
Weight of Evidence/Cancer Guideline Description (6.1,6.2)	An EPA classification system for characterizing the extent to which the available data indicate that an agent is a human carcinogen.	***EPA Group:*** ***A - Human carcinogen*** ***B1 - Probable human carcinogen - indicates that limited human data are available.*** ***B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans.*** ***C - Possible human carcinogen*** ***D - Not classifiable as a human carcinogen*** ***E - Evidence of noncarcinogenicity*** ***Weight of Evidence:*** ***Known/Likely*** ***Cannot be Determined*** ***Not Likely***
95% UCL of Normal Data (3)	The statistic for the 95% Upper Confidence Limit (UCL) on the arithmetic mean of measured data.	***Refer to National guidance (Supplemental Guidance to RAGS: Calculating the Concentration Term, OSWER Directive: 9285.7-08l, May 1992) and Regional guidance for calculating this term.*** ***Supplemental information should be provided in the risk assessment.***